

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

3016429 (17732.6357.003)

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on _____

Signature _____

Typed or printed
name _____

Application Number

10/618,067

Filed

July 11, 2003

First Named Inventor

Jifa Hao

Art Unit

2822

Examiner

Rose, Kiesha L.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐

applicant/inventor.

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assignee of record of the entire interest.

See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

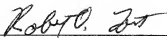
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attorney or agent of record.

Registration number _____

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attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 28,441

Signature

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Typed or printed name

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March 28, 2008

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

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*Total of _____ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/618,067 Confirmation No. 4314
Applicant : Jifa Hao, et al.
Filed : July 11, 2003 Art Unit: 2822
Title : DENSE TRENCH MOSFET WITH DECREASED ETCH
SENSITIVITY TO DEPOSITION AND ETCH PROCESSING
Examiner : Rose, Kiesha L.
Docket No. : 3016429 (17732.6357.003)
Customer No. : 44,331

**APPLICANTS' REMARKS FOR PRE-APPEAL BRIEF REQUEST FOR
REVIEW**

Sir:

Applicants respectfully request that a panel of examiners formally review the legal basis and a factual basis of the rejections in the above-referenced application prior to filing of an appeal brief.

1. The examiner made a factual error with regard to the usefulness of the combination of Hshich and Itoh.

All of the pending claims stand rejected under 35 U.S.C. 103(a) based on the combination of Hshich (U.S. Patent 6,051,468) in view of Itoh (U.S. Patent 5,034,341). The rejection of claim 14, the only independent claim, is in the paragraph bridging pages 2 and 4 of the final Office Action dated November 16, 2007. This paragraph contains the following sentence:

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Hshich by incorporating the highly conductive layer to extend across the trenches to form a bitline for the device as taught by Itoh.

Applicant's response to this combination of Hshich and Itoh is stated in the "Remarks" section of the "Response to Office Action" filed on January 15, 2008 which stated (1) that the highly conductive layer of Itoh is not "a material reacted from a metal and the semiconductor substrate," (2) that the highly conductive layer of Itoh is polysilicon, and (3) that there is no reason to incorporate the highly conductive layer of Itoh into Hshich since the silicide regions 118 in Hshich are connected by the source contact metal layer 68 which forms a highly conductive layer, and (4) that the combination of Hshich and Itoh as stated in the final Office Action does not establish a *prima facie* case of obviousness because a mere statement that the claimed invention is within the capabilities of one of ordinary skill in the art. Section 11 of the Advisory Action dated March 3, 2008 stated that "Itoh discloses that the highly conductive layer 73/222 is made of silicide (Col. 13, lines 59-61)."

The bitline 73/222 of Itoh must be formed from polysilicon since it extends across the insulating layer 218 as shown in FIG. 4 and as described in column 11, in the paragraph beginning on line 14. The bit line can be made into a silicide by reacting a suitable metal with the polysilicon.

Therefore, "incorporating the highly conductive layer to extend across the trench to form a bitline for the device as taught by Itoh" would involve placing a polysilicon layer on top of the device shown in 6A with the masked oxide layer 104 removed, or on top of the device shown in FIG. 6 of Hshich either before or after the source contact metal layer 68 is formed.

If the bitline of Itoh were placed on the device shown in FIG. 6A, the silicide bitline of Itoh formed from polysilicon would short together the gate electrode and the source and the device would not be usable. Hshich forms the silicide 118 by a blanket deposition and anneal of titanium silicide on the device, and the titanium silicide does not react with an oxide as described in column 10, lines 45-47. Thus there is no silicide on the spacer layer 74, and the gate electrode is not shorted to the source.

With respect to placing the bitline of Itoh on the device shown in FIG. 6, The bitline of Itoh would not then extend from a first trench to a second trench. Moreover, there would be no benefit to placing such a bit line on the Hshich device either below or above the source contact metal layer 68 since the source metal contact layer 68

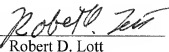
has a lower resistivity than the silicide formed from polysilicon. The addition of the bitline 73/222 of Itoh would add an unnecessary processing step to the fabrication of the Hshich device.

II. The examiner made a factual error with regard to a limitation in claim 14 which is not present in the combination of Hshich and Itoh.

Claim 14 states in paragraph g) that the highly conductive layer on the surface of the source layer comprises a material reacted from metal and the substrate. When a silicide is formed, the top portion of the semiconductor material is converted into a silicide, and therefore the silicide extends into the semiconductor material. As described above, the silicide bitline of Itoh is not formed by a reaction of a metal and the substrate.

Applicants respectfully requests that the panel decide that the application should be allowed or that the prosecution on the merits should be reopened.

Respectfully submitted,
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